UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/682,236	10/09/2003	Yoshihiro Kawano	16121	1021

23389 7590 05/18/2007
SCULLY SCOTT MURPHY & PRESSER, PC
400 GARDEN CITY PLAZA
SUITE 300
GARDEN CITY, NY 11530

EXAMINER	
WILLIAMS, DON J	

ART UNIT	PAPER NUMBER
2878	

MAIL DATE	DELIVERY MODE
05/18/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

TH

Office Action Summary	Application No.	Applicant(s)
	10/682,236	KAWANO ET AL.
	Examiner	**Art Unit**
	Don Williams	2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Applicant's arguments with respect to the rejection(s) of claim(s) 1-25 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-16 and 20-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwasaki in view of MacAulay et al and further in view of Luellau (6,844,920).

As to claim 1, Iwasaki discloses a scanning optical microscope having a laser beam source (10), at least one lens (15, 18) for converging beams of light (11A, 11B) of different cross-sectional shape aspect ratio to create a linear or collimated light (11A, 11B), a first light modulation member (13A, 13B) which is disposed to a (beam splitter, 12) such that the linear light (11, 11A, 11B) is incident on the first light modulation member (13A, 13B), a lens (15, 18) for forming the light (11A, 11B) as a parallel light (11A, 11B), one scanning member (galvanometric mirror, 14) that scans in a X-Y-Z direction corresponding to being capable of scanning in a vertical and horizontal direction of the linear light (11A, 11B), the scanning member (14) being disposed

between the first light modulation member (13A, 13B) and a sample (20), at least one lens (18) for focusing the light (11A, 11B) to which the shade has been imparted to the sample body (20), and at least one lens (22) for imaging the reflected light (11A, 11B or 11') from the sample body (20) or the light generated by the sample body (20) on a light detecting element (25), (figure 1, column 3, lines 50-68, column 4, lines 1-20, lines 37-67). Iwasaki fails to explicitly disclose a lens member for altering the cross-sectional shape aspect ratio of a beam of light emitted from the light source and a first light modulation member being disposed to a lens such that the linear light is incident on the first modulation member. Iwasaki, MacAulay et al, and Luellau are related scanning devices. MacAulay et al disclose (fig. 3) a lens member (lens) for altering the crossed-sectional shape aspect ratio of a beam of light emitted from the light source (4) and a spatial light modulation member (8) being disposed to a lens (40) such that the linear light is incident on the spatial light modulation member (8). Lenses are well known in the art for converging and projecting light. It would have been obvious for one ordinary skill in the art to modify Iwasaki in view of MacAulay et al to include lenses along the light path to alter or change the cross-sectional shape of the linear light and to enhance the focus of the linear light onto the modulation member in order to improve the ability to distinguish and detect the modulated light images. Iwasaki in view of MacAulay et al fails to explicitly disclose a first light modulation member for imparting shade to the converged linear light. Luellau disclose that all pixels of (light modulator, 7) are triggered with an average gray value by generating a gray mask in order to invert the gray shades of the pixels which is a function of pixels luminosity distribution produced on the printing

plate, (figure 1, column 2, lines 28-40, column 3, lines 20-27). Luellau further teaches artwork pattern can be provided with an electronically stored gray mask that corresponds to the printing plate or object, (column 3, lines 20-27). The teachings of Luellau constitute a first modulator member imparting shade (gray shade) to the converged linear light. It would have been obvious for one of ordinary skill in the art to modify Iwasaki in view of MacAulay et al and further in view of Luella to include a light modulator that can project a gray shade onto the converged linear light in order to improve the pattern of the object resulting in a clear and precise image that can be displayed on a monitor for further analysis.

As to claim 2, Iwasaki discloses that the light detection element is a photodetector (25), (figure 1, column 4, lines 45-47).

As to claim 3, Iwasaki discloses that the illumination light source is a laser beam source (10), (figure 1, column 3, lines 50-67).

As to claim 4, Iwasaki discloses a (laser beam source, 10), (figure 1, column 3, lines 50-67). Iwasaki fails to explicitly disclose a white light source. MacAulay et al disclose a white light source, an arc lamp or a laser, (column 9, lines 50-55), It would have been obvious for one ordinary skill in the art to modify Iwasaki in view of MacAulay et al to replace the white light source or a xenon arc lamp with any selected from the claimed group since they are functionally equivalent means of illuminating a sample.

As to claim 5, Iwasaki discloses a second light modulation member (13A, 13B) that can impart a confocal effect or light spot (P) to light (11A, 11B) from the sample body (20), and the confocal effect or light spot (P) can be optimized or reduced by

changing one of the beam diameter (11A, 11B) and number of the beams (11A, 11B) of the light transmitted through the light modulation member (13A, 13B), (figure 1, column 3, lines 50-67, column 4, lines 53-67).

As to claim 6, Iwasaki discloses a computer (24, 28) for controlling the start and stopping operations and the regulation of the scanning speed of the scanning member (14), a computer (24, 27A, 27B) for controlling the illumination pattern of the light modulation member (13A, 13B), and the on/off irradiation of the illumination light (11A, 11B) on the sample body (20), (figure 1, column 5, lines 5-15).

As to claim 7, Iwasaki discloses interference fringes (17) being formed by the splitting of the light (11) from the light source (10) into a plurality of beams (11A, 11B) and the interference (17) of the plurality of beams (11A, 11B), and a lens (15) and an optical member (18) necessary for the formation of the interference fringes (17), (fig. 2, column 4, lines 24-36). MacAulay et al disclose a digital mirror device having a plurality of reflecting mirrors that are capable of being switched on and off wherein each mirror does not reflect incident light (11A, 11B) when in the off state and reflects incident light (11A, 11B) when in the on state,(column 8, lines 13-35, column 20, lines 56-67). Iwasaki in view of MacAulay and further in view of Luellau fails to explicitly disclose a diffraction grating. Diffraction gratings are well known in the art for splitting light. Iwasaki does disclose a beam splitter that splits light (11) into a plurality of linear laser beams (11A, 11B), (figure 1, column 3, lines 52-55). It would have been obvious for one ordinary skill in the art to modify Iwasaki in view of MacAulay et al and further in view of Luellau to

use the beam splitter as a diffraction grating in order to improve the interference fringes by splitting the light into linear separate laser beams.

As to claim 8, MacAulay et al disclose a one dimensional mirror array consisting of two or more micro electro mechanical system (MEMS) are well know in the art as spatial light modulators (SLM), (fig. 1, column 8, lines 13-39).

As to claim 9, MacAulay et al disclose a liquid crystal plate having a changeable transmissivity and a SLM (spatial light modulator), (fig. 1, column 8, lines 13-39).

As to claims 10,11, 12, Iwasaki discloses that the scanning member (14) is a galvanometer mirror and wherein the position of a single point illumination light (11A, 11B) can be shifted temporally by controlling the light modulation member (13A, 13B) (see figure 1, column 3, lines 52-67). Iwasaki in view of MacAulay et al fail to explicitly disclose a shade pattern is alterable. Luellau disclose that all pixels of (light modulator, 7) are triggered with an average gray value by generating a gray mask in order to invert the gray shades of the pixels which is a function of pixels luminosity distribution produced on the printing plate, (figure 1, column 2, lines 28-40, column 3, lines 20-27). Luellau further teaches artwork pattern can be provided with an electronically stored gray mask that corresponds to the printing plate or object, (column 3, lines 20-27). The teachings of Luellau constitute shade pattern being alterable. It would have been obvious for one of ordinary skill in the art to modify Iwasaki in view of MacAulay et al and further in view of Luella to include a light modulator that can simultaneously illuminate and alternate a gray shade onto the converged linear light in order to scan

and improve the shade pattern of the object resulting in a clear and precise image that can be displayed on a monitor for further analysis.

As to claim 13, MacAulay et al discloses lens member (lens) alter the cross-sectional shape ratio of the light beam emitted from the light source (4) comprises one or more cylindrical lens (lens), (fig. 3).

As to claim 14, Iwasaki discloses a scanning member comprise a galvanometer (14), (figure 1, column 3, lines 55-65).

As to claim 15, Iwasaki discloses that the sample body (20) is scanned several times by a linear illumination lights (11A, 11B) and one image (Q) is produced from the plurality of scanned data (see figure 1, column 4, lines 53-67). Iwasaki in view of MacAulay et al fail to explicitly disclose shade pattern. Luellau disclose that all pixels of (light modulator, 7) are triggered with an average gray value by generating a gray mask in order to invert the gray shades of the pixels which is a function of pixels luminosity distribution produced on the printing plate, (figure 1, column 2, lines 28-40, column 3, lines 20-27). Luellau further teaches artwork pattern can be provided with an electronically stored gray mask that corresponds to the printing plate or object, (column 3, lines 20-27). The teachings of Luellau constitute shade pattern. It would have been obvious for one of ordinary skill in the art to modify Iwasaki in view of MacAulay et al and further in view of Luella to include a light modulator that can simultaneously illuminate and alternate a gray shade onto the converged linear light in order to scan and improve the shade pattern of the object resulting in a clear and precise image that can be displayed on a monitor for further analysis.

As to claim 16, Iwasaki discloses illumination light source comprises a laser (10) and a laser beam (11), (fig. 1, column 3, lines 52-54). MacAulay discloses that the light beam is introduced into the lens member (20) through a fiber (14) (fig. 1, column 10, lines 55-67).

As to claim 20, MacAulay et al disclose Raman spectrum, (column 1, lines 20-30, column 8, lines 40-50).

As to claim 21, MacAulay et al disclose a two-dimensional imaging device (CCD) (column 9, lines 25-36, column 16, lines 29-30).

As to claims 22-24, Iwasaki discloses a photodetector or a photomultiplier, 25, (figure, 1, column 4, lines 45-47). Iwasaki fails to explicitly disclose the exact type CCD camera or detecting elements claimed. Detecting elements as claimed are well known in the art for receiving light outputs corresponding to incident light on a sample. MacAulay et al disclose a (CCD, charge coupled device camera), (column 7, lines 4-42, column 9, lines 23-40). It would have been obvious for one ordinary skill in the art to modify Iwasaki in view of MacAulay et al to replace the CCD camera with any selected from the claimed group since they are functionally equivalent as means of detecting light from a sample.

Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwasaki in view of MacAulay et al, in view of Luellau, as applied to claim 1 and further in view of Hoffman et al (US2002/0024015).

As to claim 17, Iwasaki discloses a laser beam source, 10), (fig. 1, column 3, lines 52-53). MacAulay et al disclose a fluorescent sample body (22), (column 8, lines 40-56). Iwasaki in view of MacAulay et al, in view of Luellau fail to disclose the use of an ultra short pulse laser, multi-photon excitation with two photon and three photon excitation. Hoffmann et al disclose an ultra short pulse laser, a multi-photon excitation with a two photon and a three photon excitation. It would have been obvious for one ordinary skill in the art to modify Iwasaki in view of MacAulay et al , in view of Luellau, and further in view of Hoffman et al to include an ultra short pulse laser, a multi-photon excitation comprising two photon and three photon excitation as to illuminate and excite the sample in order to improve and obtain a clear and precise image, (see paragraph [003]).

As to claim 18, Hoffmann et al disclose a titanium sapphire laser, (paragraph [003]).

As to claim 19, Iwasaki discloses a photodetector (25), a sample body (20), and modulation member (13A, 13B), (see fig. 1, column 3, lines 55-60, column 4, lines 45-50). Iwasaki in view of MacAulay et al, in view of Luellau fail to disclose a spectral diffraction device, and a prism. Hoffmann et al disclose grating pair (14, 15) and prisms (16, 17), (paragraph [0047]). It would have been obvious for one ordinary skill in the art to modify Iwasaki in view of MacAulay et al, in view of Luellau, and further in view of Hoffman et al to use a grating pair as a spectral diffraction device along with the prisms to split or spread the scanning beam to increase the optical efficiency in order to acquire a precise light spot or light pattern on the sample when being scanned.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Don Williams whose telephone number is 571-272-8538. The examiner can normally be reached on 8:30a.m. to 5:30a.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Georgia Y. Epps

Georgia Epps
Supervisory Patent Examiner
Technology Center 2800